Fig. 1

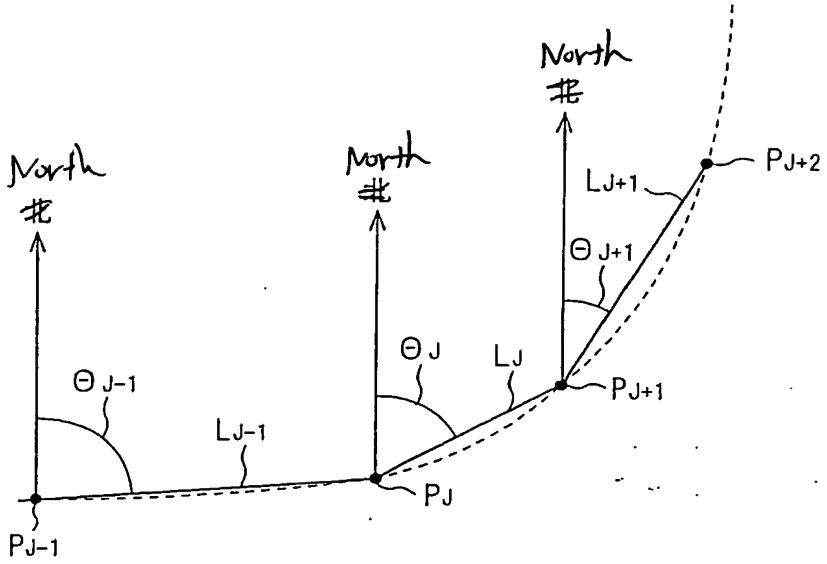


Fig. 2 (a)

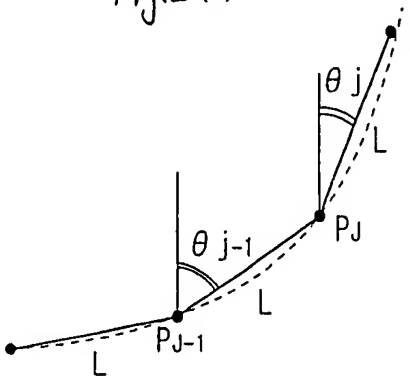


Fig. 2 (b)

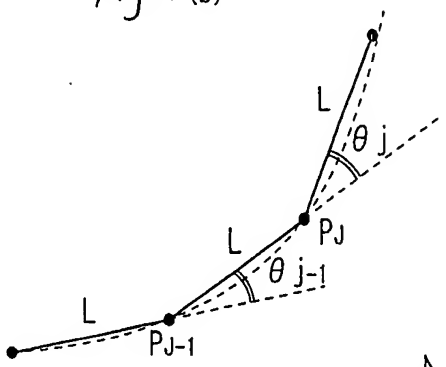


Fig. 2 (c)

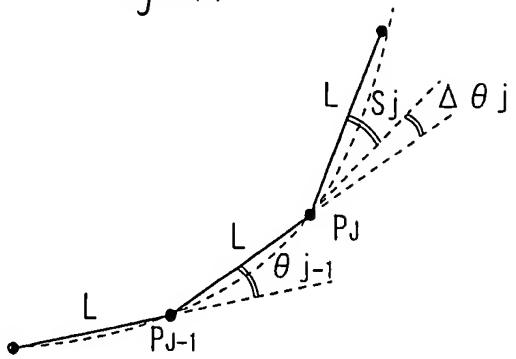


Fig. 2 (d)

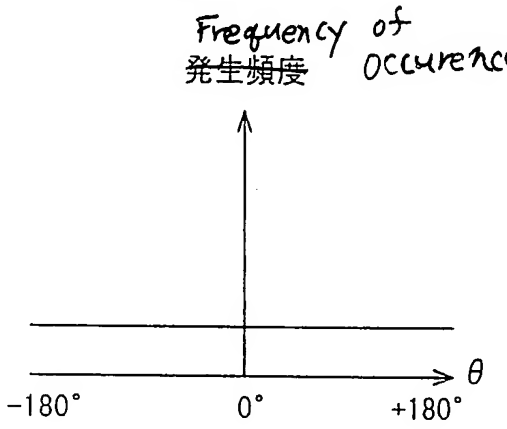


Fig. 2 (e)

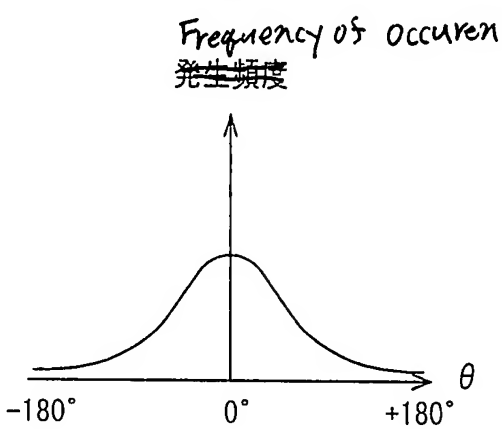


Fig. 2 (f)

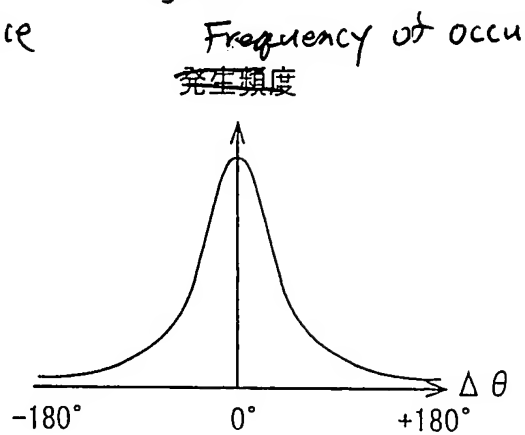


Fig.3

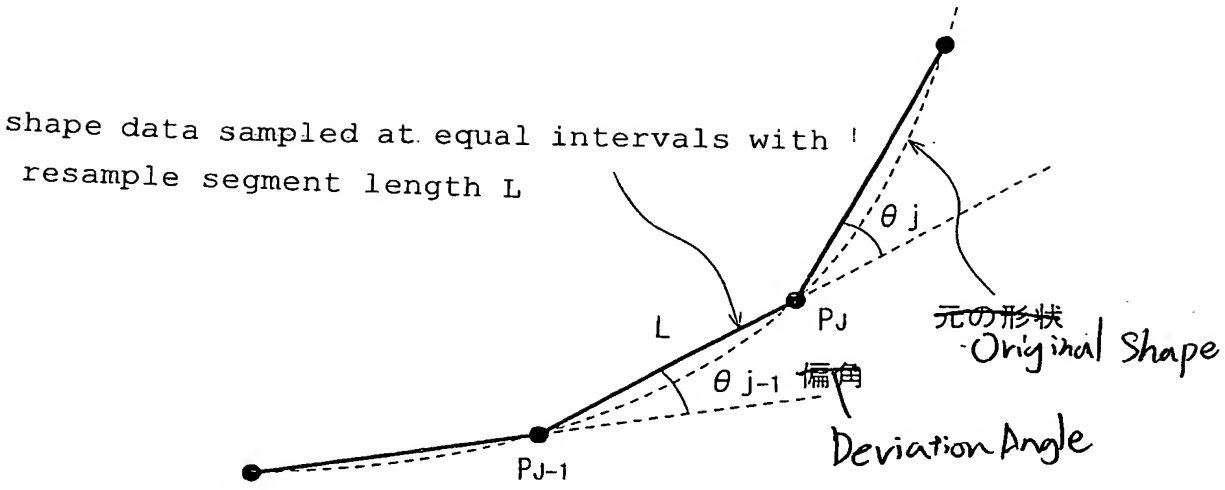

shape data sampled at equal intervals with
resample segment length L
θ j
L
PJ
元の形状
Original Shape
θ j-1 偏角
Deviation Angle
PJ-1

Fig.4

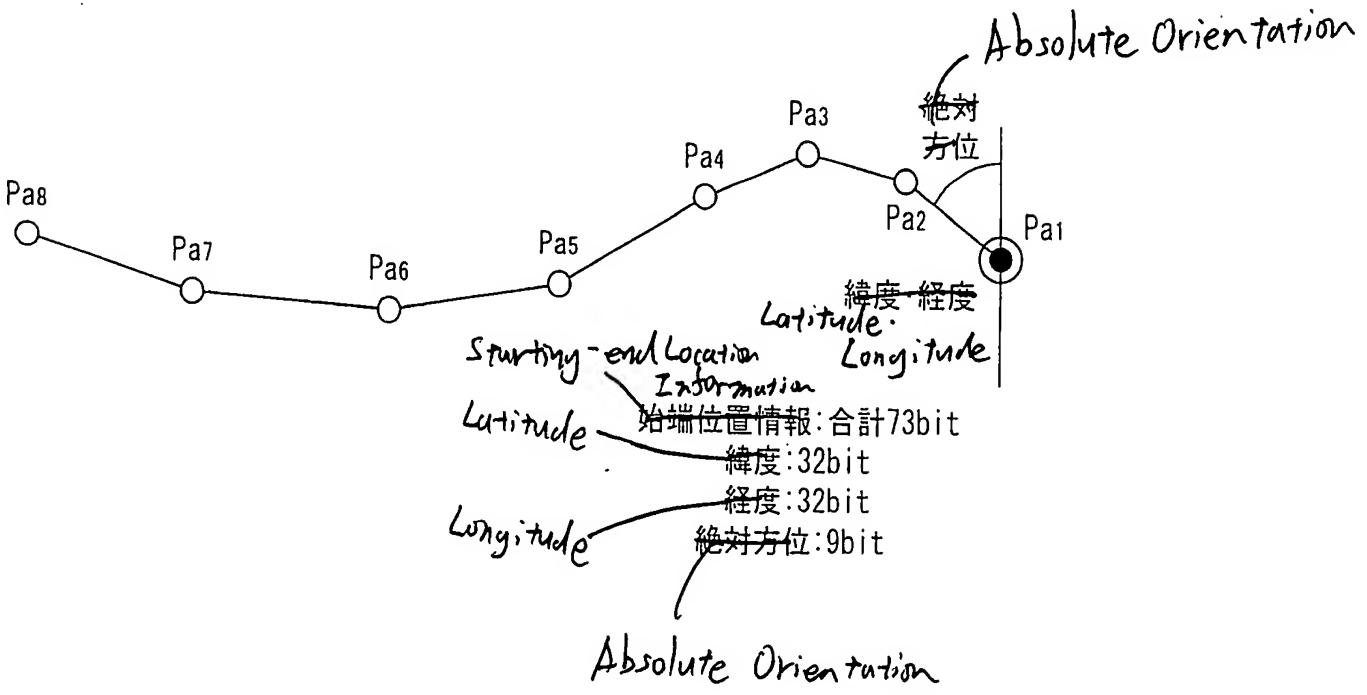


Fig. 5

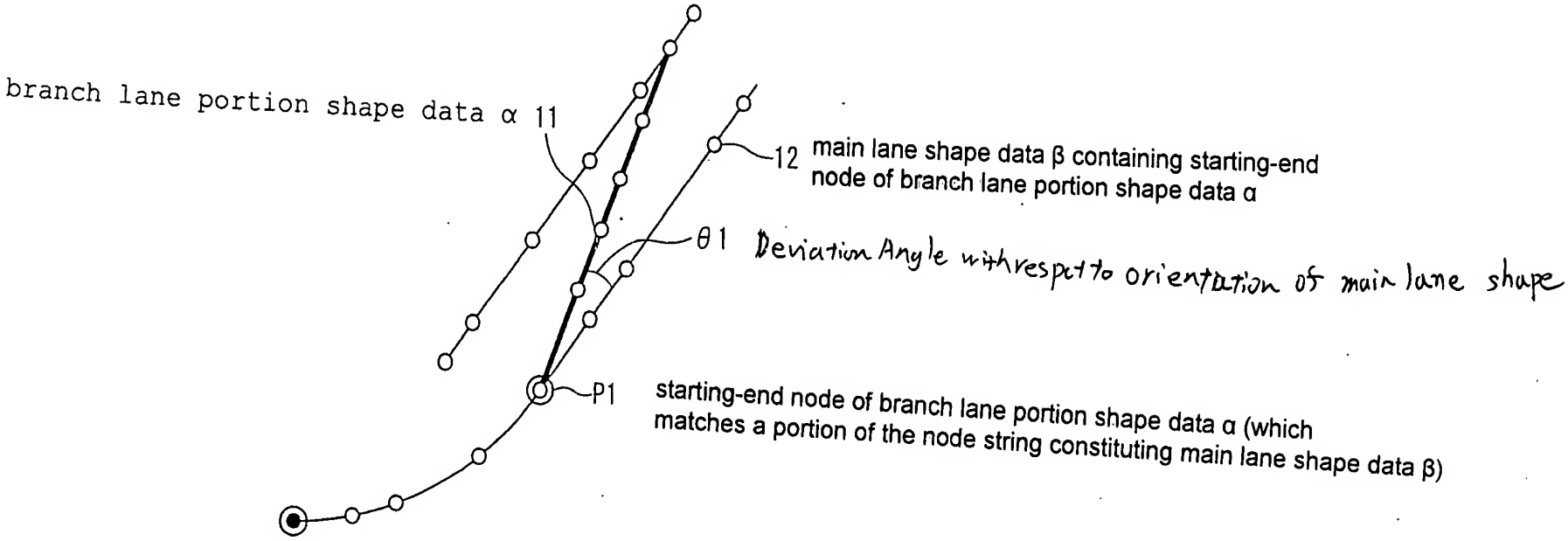


Fig.6

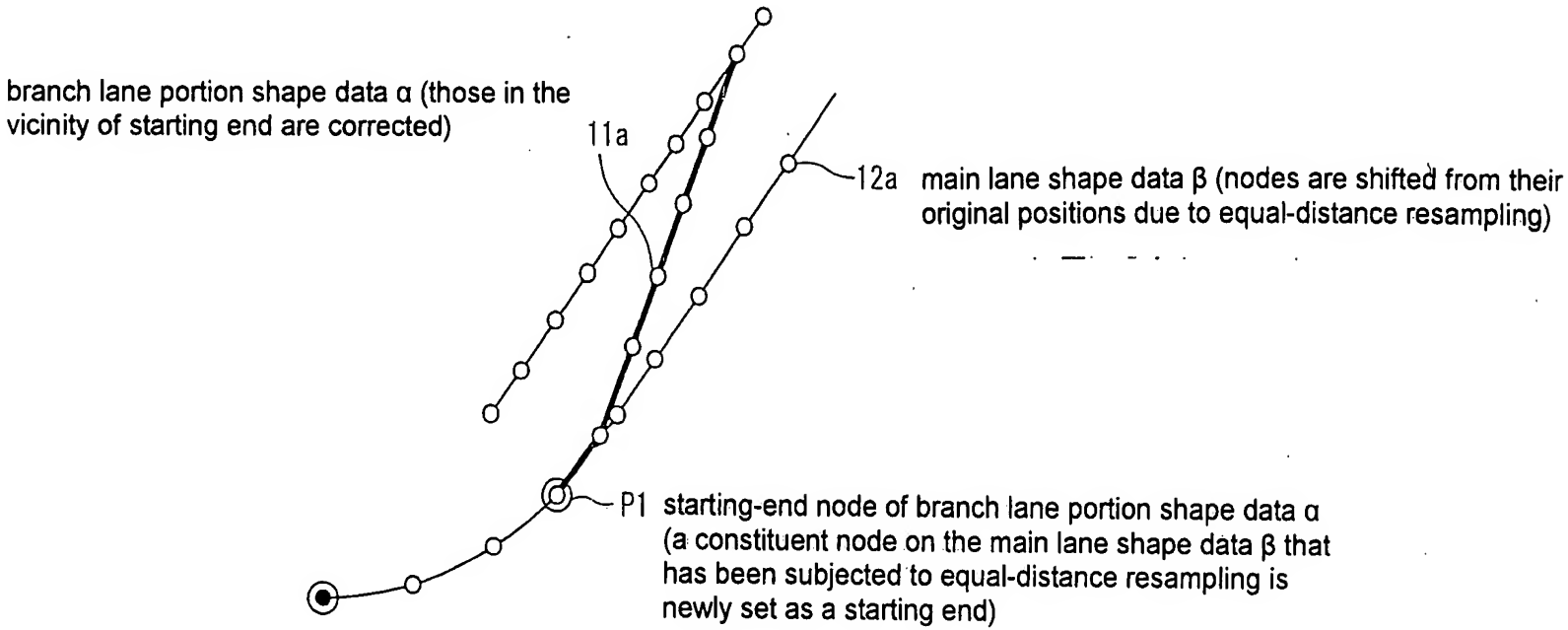


Fig. 7

100

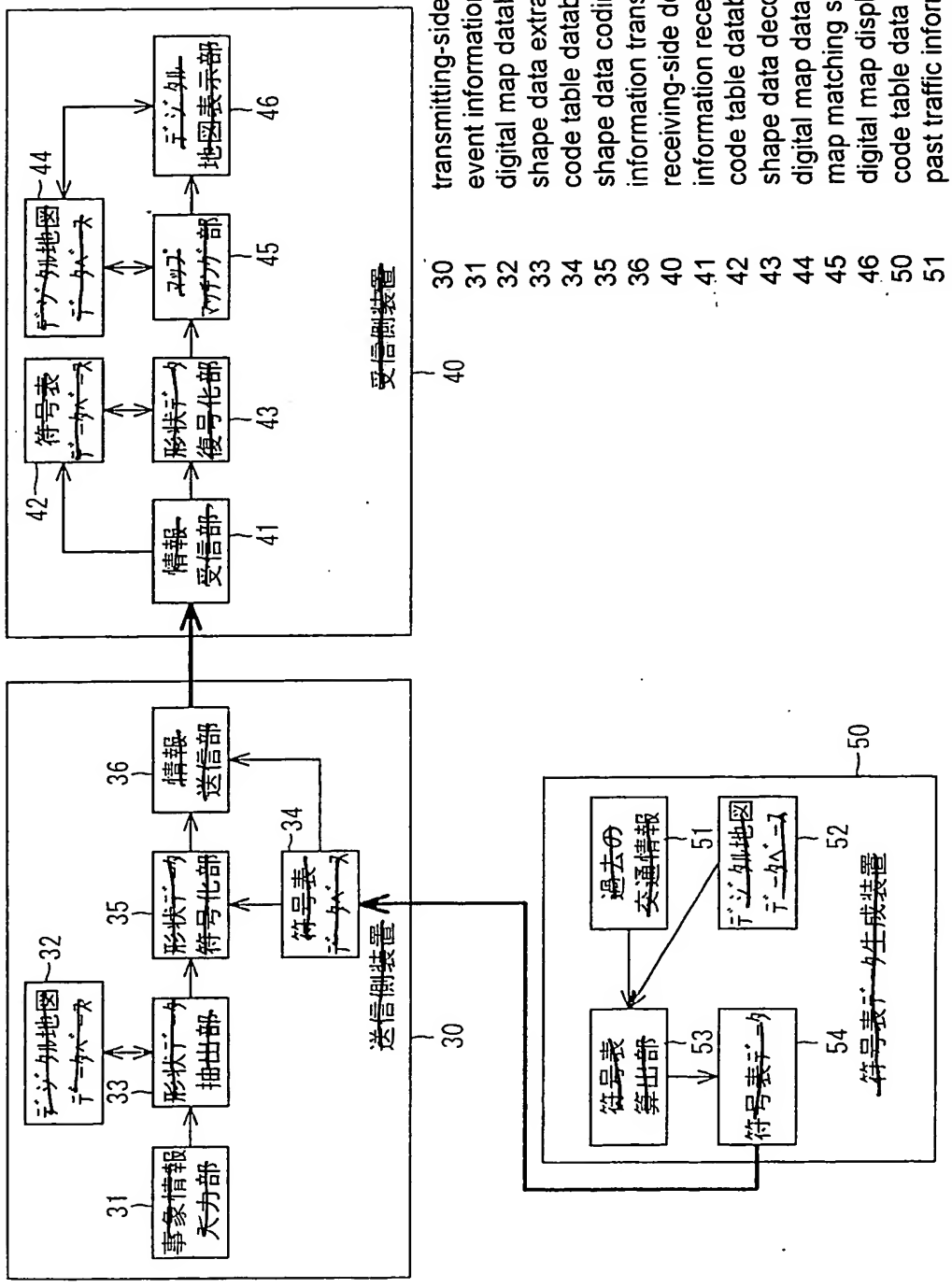
vector data type (= road)
shape data number (#1)
code table number
sample segment length L (m)
total node number
representation form identifier of starting-end location (= absolute latitude and longitude)
absolute coordinate of node P1 in X orientation (longitude)
absolute coordinate of node P1 in Y orientation (latitude)
absolute orientation between nodes P1 → P2
coded data of shape (bit string of deviation angle θj or deviation angle statistical predicted value difference Δθj that is coded)
. . .
shape data number (#2)
. . .

100

Fig. 8

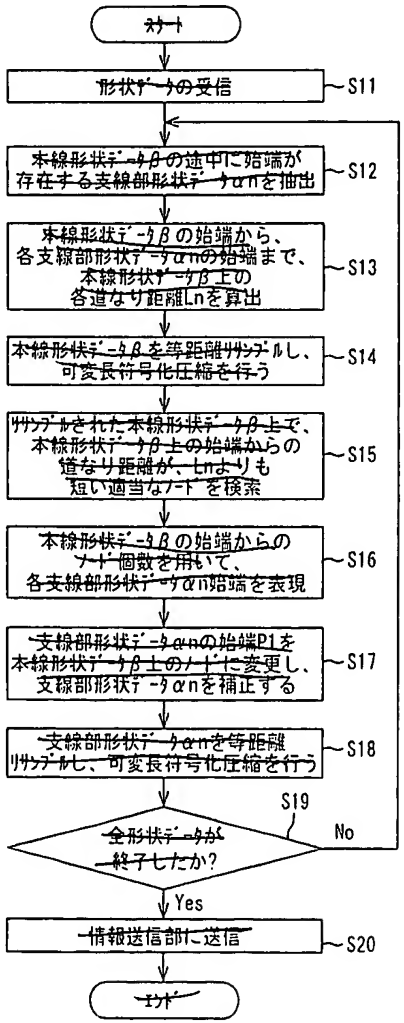
vector data type (= road)
shape data number (#1)
code table number
sample segment length L (m)
total node number
representation form identifier of starting-end location (= first representation form)
shape data number to be referenced (= β)
number of nodes from the starting end of shape data β
deviation angle from the orientation of main lane shape
coded data of shape (bit string of deviation angle θj or deviation angle statistical predicted value difference Δθj that is coded)
. . .
shape data number (#2)
. . .

Fig. 9



30 transmitting-side device
31 event information input section
32 digital map database
33 shape data extracting section
34 code table database
35 shape data coding section
36 information transmitting section
40 receiving-side device
41 information receiving section
42 code table database
43 shape data decoding section
44 digital map database
45 map matching section
46 digital map displaying section
50 code table data generating device
51 past traffic information
52 digital map database
53 code table calculating section
54 code table data

Fig. 10



start

S11 receive shape data

S12 extract branch lane portion shape data αn such that its starting end exists in the main lane shape data β

S13 calculate each route distance Ln on main lane shape data β from starting end of main lane shape data β to starting end of each branch lane portion shape data αn

S14 resample main lane shape data β at equal distances and perform variable length coding compression

S15 search an appropriate node on resampled main lane shape data β the route distance of which is shorter than Ln from starting end on main lane shape data β

S16 represent starting end of branch lane portion shape data αn using the number of nodes from starting end of main lane shape data β

S17 change starting end P1 of branch lane portion shape data αn into node on main lane shape data β and correct branch lane portion shape data αn

S18 resample branch lane portion shape data αn at equal distances and perform variable length coding compression.

S19 all shaped data processed?

S20 transmit data to information transmitting section

end

Fig. 11

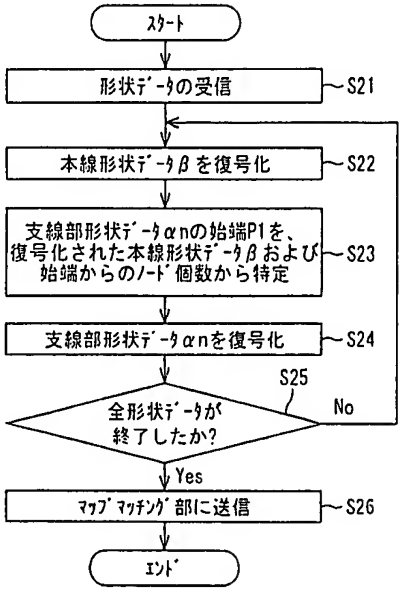


Fig. 11

start

S21 receive shape data

S22 decode main lane shape data β

S23 identify starting end P1 of branch lane portion shape data αn from decoded main lane shape data β and number of nodes from starting end

S24 decode branch lane portion shape data αn

S25 all shape data processed?

S26 transmit data to map matching section

end

Fig. 12

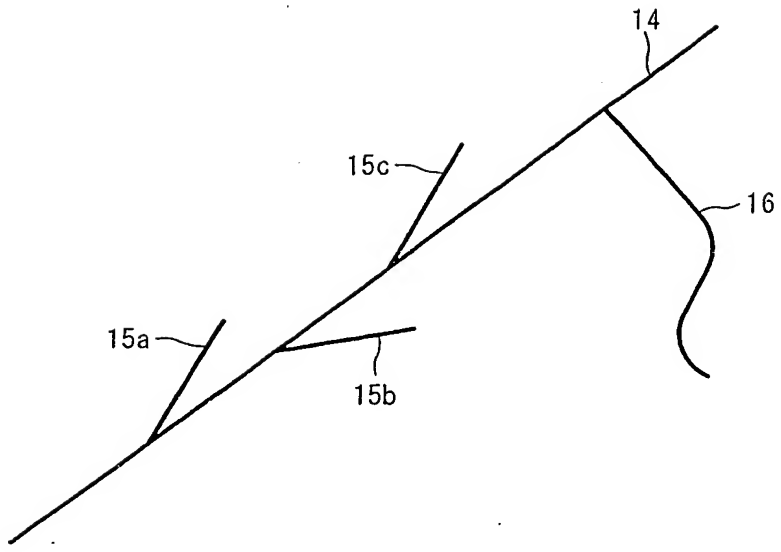


Fig. 13

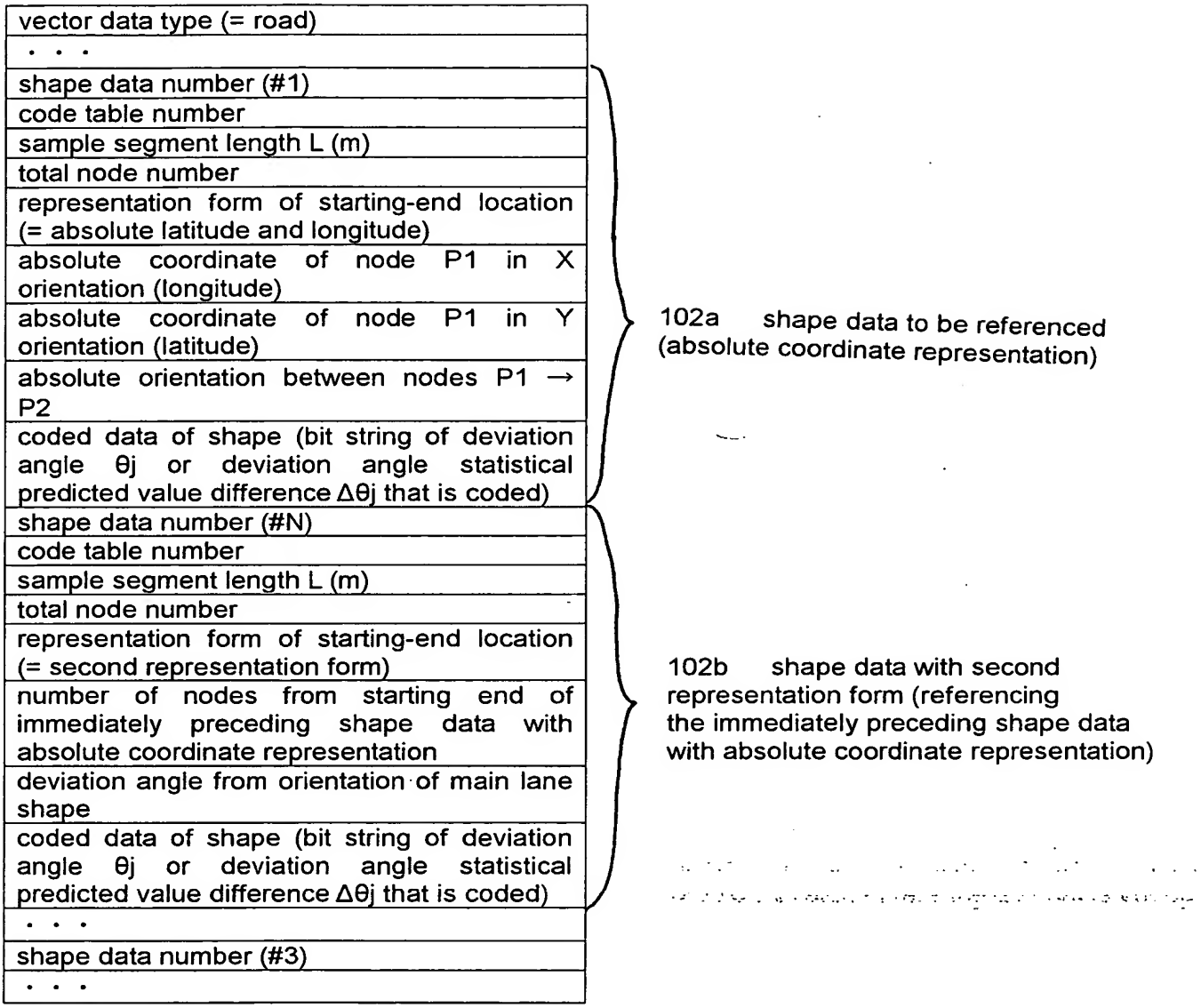

vector data type (= road)
• • •
shape data number (#1)
code table number
sample segment length L (m)
total node number
representation form of starting-end location (= absolute latitude and longitude)
absolute coordinate of node P1 in X orientation (longitude)
absolute coordinate of node P1 in Y orientation (latitude)
absolute orientation between nodes P1 → P2
coded data of shape (bit string of deviation angle θj or deviation angle statistical predicted value difference Δθj that is coded)
shape data number (#N)
code table number
sample segment length L (m)
total node number
representation form of starting-end location (= second representation form)
number of nodes from starting end of immediately preceding shape data with absolute coordinate representation
deviation angle from orientation of main lane shape
coded data of shape (bit string of deviation angle θj or deviation angle statistical predicted value difference Δθj that is coded)
• • •
shape data number (#3)
• • •
102a shape data to be referenced (absolute coordinate representation)
102b shape data with second representation form (referencing the immediately preceding shape data with absolute coordinate representation)

Fig.14

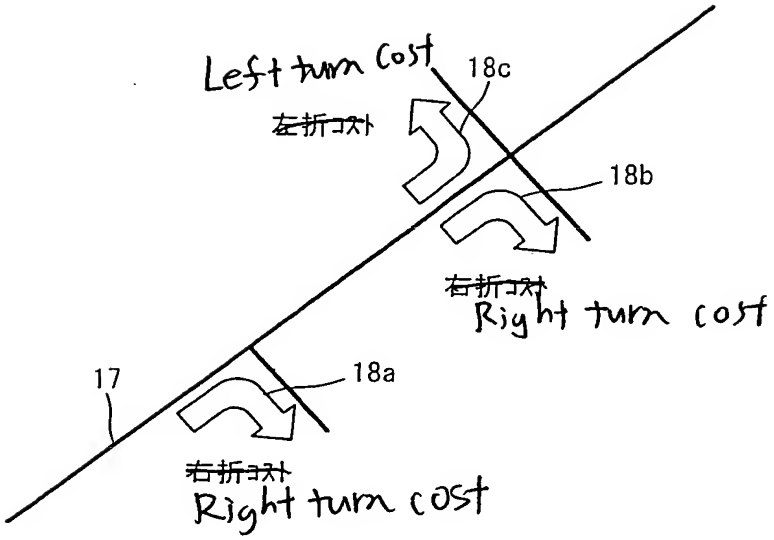

Left turn cost
18c
左折コスト
18b
右折コスト
Right turn cost
17
18a
右折コスト
Right turn cost

Fig. 15

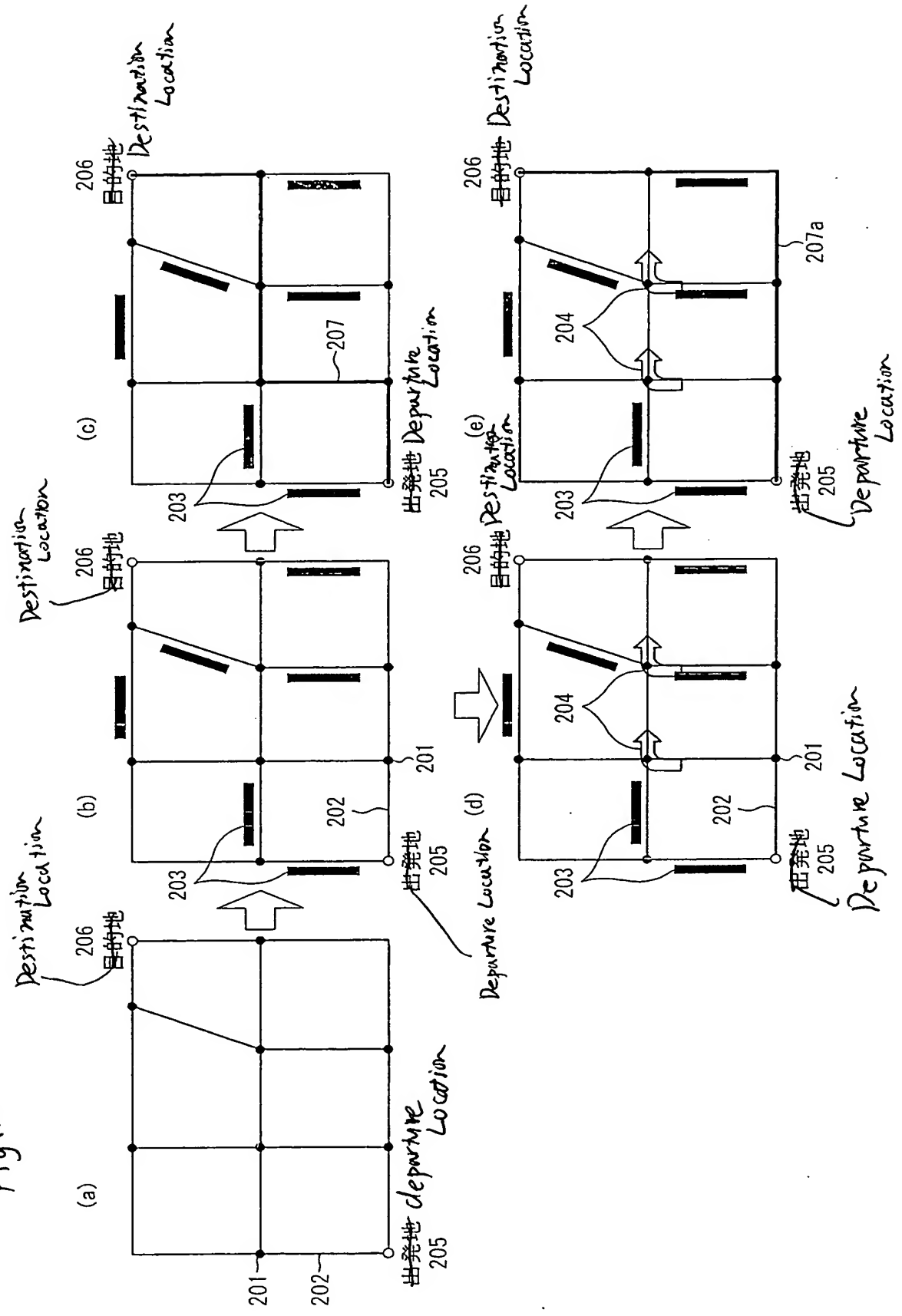

(a)
(b)
(c)
(d)
(e)
Destination
Location
目的地
departure
Location
出発地
201
202
203
204
205
206
207
207a

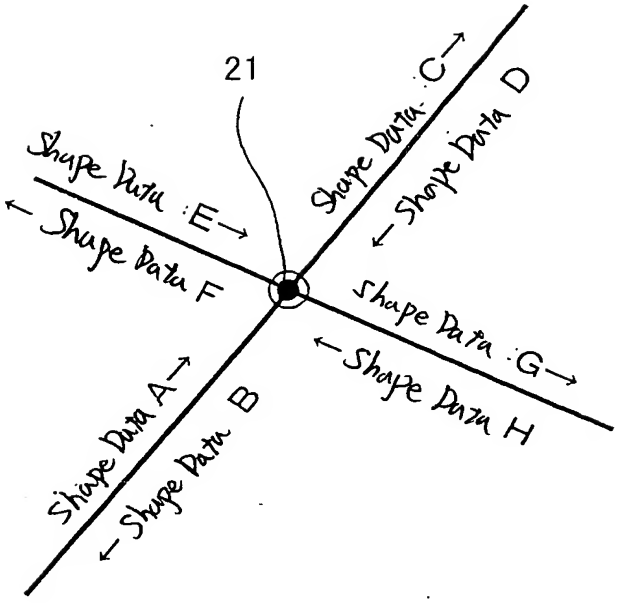
Fig. 16(a)

vector data type (= road)	103
• • •	
shape data number (#N–1)	103a
code table number	
sample segment length L (m)	
total node number	
representation form of starting-end location (= absolute latitude and longitude)	
absolute coordinate of node P1 in X orientation (longitude)	
absolute coordinate of node P1 in Y orientation (latitude)	
absolute orientation between nodes P1 → P2	
coded data of shape (bit string of deviation angle θj or deviation angle statistical predicted value difference Δθj that is coded)	
shape data number (#N)	103b
code table number	
sample segment length L (m)	
total node number	
representation form of starting-end location (= third representation form) number of nodes from starting end of preceding shape data	
deviation angle from orientation of main lane shape	
coded data of shape (bit string of deviation angle θj or deviation angle statistical predicted value difference Δθj that is coded)	
• • •	
shape data number (#3)	
• • •	

Fig. 16(a)

reference shape data number = N	104
left/right turn waiting time	
• • •	

Fig. 17



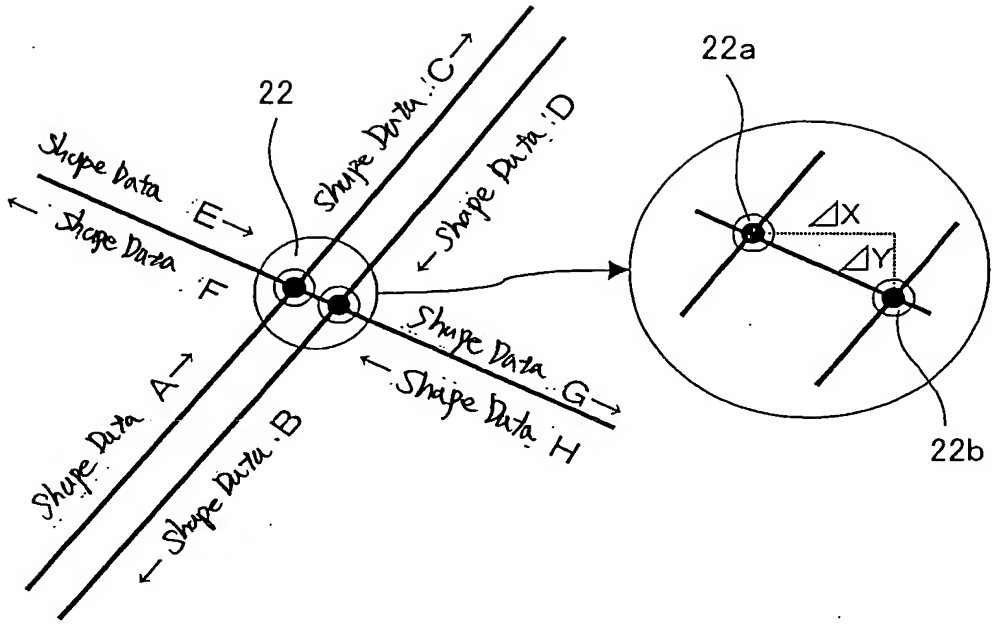
terminal end of shape data A
= starting end of shape data B
= starting ends of shape data C, F, G
= terminal ends of shape data D, E, H

Fig. 18

vector data type (= road)
shape data number (= α)
code table number
sample segment length L (m)
total node number
representation form of starting-end location (= fourth representation form)
shape data number to be referenced (= β)
identification of starting end/terminal end (= terminal end)
absolute orientation between starting end → next node
coded data of shape (bit string of deviation angle θj or deviation angle statistical predicted value difference Δθj that is coded)
• • •
shape data number (= X)
• • •

105

Fig.19



terminal end of shape data A + (ΔX, ΔY)
= starting ends of shape data B, G
= terminal ends of shape data D, H

Fig. 20

vector data type (= road)
shape data number (= α)
code table number
sample segment length L (m)
total node number
representation form of starting-end location (= fifth representation form)
shape data number to be referenced (= β)
identification of starting end/terminal end (= terminal end)
offset ΔX in longitude orientation
offset ΔY in latitude orientation
absolute orientation between starting end → next node
coded data of shape (bit string of deviation angle θj or deviation angle statistical predicted value difference Δθj that is coded)
• • •
shape data number (= X)
• • •

106

Fig. 21

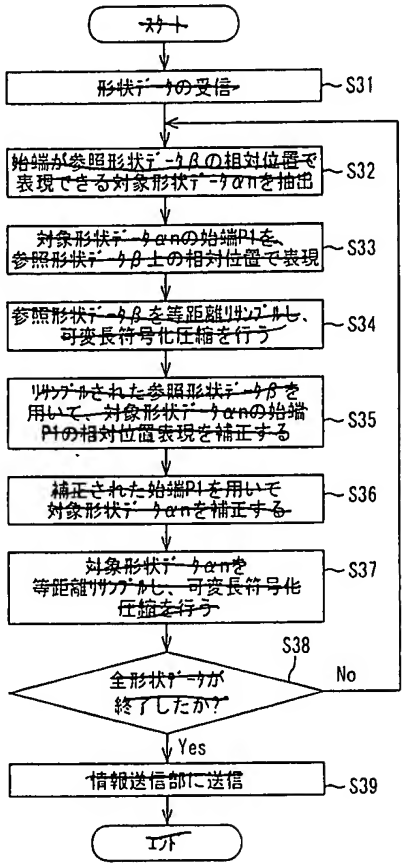


Fig. 21

start

S31 receive shape data

S32 extract subject shape data αn whose starting end can be represented by relative location of reference shape data β

S33 represent starting end P1 of subject shape data αn with relative location on reference shape data β

S34 resample reference shape data β at equal distances and perform variable length coding compression

S35 correct relative location representation of starting end P1 of subject shape data αn using resampled reference shape data β

S36 correct subject shape data αn using corrected starting end P1

S37 resample subject shape data αn at equal distances and perform variable length coding compression

S38 all shape data processed?

S39 transmit data to information transmitting section

end

Fig.22

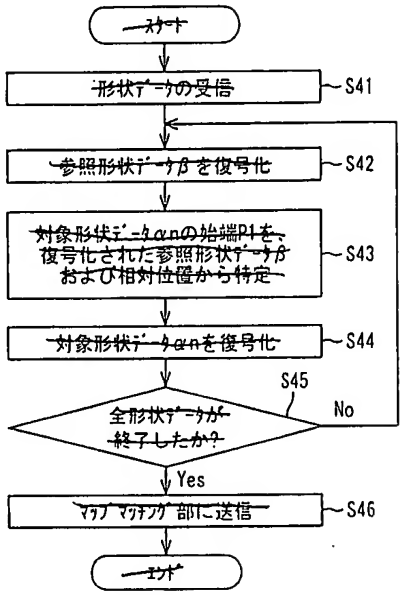


Fig. 22

start

S41 receive shape data

S42 decode reference shape data β

S43 identify starting end P1 of subject shape data αn from decoded reference shape data β and its relative location

S44 decode subject shape data αn

S45 all shape data processed?

S46 transmit data to map matching section

end